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600 13th Street, N.W.
Washington, DC 20005-3096

EXAMINER

WERNER, BRIAN P

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

2621

DATE MAILED: 08/16/2004

10

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/748,138

Applicant(s)

IDE ET AL.

Examiner

Brian P. Werner

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 May 2004.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 6-20 is/are pending in the application.
4a) Of the above claim(s) 16-20 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-3 and 6-15 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This Office Action is responsive to the amendment and arguments received on February 19, 2004. Claims 1-3 and 6-20 remain pending.

Election/Restrictions

2. Applicant's election without traverse of claims 1-3 and 6-15 in the reply filed on May 27, 2004 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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4. Claim 6 is rejected under 35 U.S.C. 102(b) as being anticipated by Minoru (JP 05-107051 A – Based on an Oral Translation provided by a PTO translator: An Official written translation has been ordered, and will be provided with the next Office Action).

Minoru discloses a 3D shape measuring system (figure 4; “3D mode measurement machine” and “three dimension in X-Y-Z space” at paragraph 003) comprising:

a measuring section (figure 4) for measuring a three-dimensional shape (“measurement by 3D mode” and “measurement result” at paragraph 0010) of an object (figure 4, numeral 30; “work piece 30” at paragraph 0003) by scanning the object (“work piece 30 is traced, namely scanned, moving the detector 21 in the direction ...” at paragraph 0003); and

a display screen (figure 1) for displaying information about an area where the scanning has been completed by the measuring section in accordance with a progress of the scanning, where the information is a message indicating the status of the scanning (figure 1, letter “E”, “time remaining”; see “computing and automatically displaying from the measuring condition ... the time amount to the end of measurement” at paragraph 0006; “measuring-time display E which displays the residual time to the end of measurement automatically in this control section” at paragraph 0010; this limitation is met by Minoru in another way as well: i.e., data regarding an area where scanning has been completed is displayed in figure 1, at letter C; i.e., see “measurement result ... an expansion record in graphic form” at paragraph 0010).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Minoru (JP 05-107051 A) as applied to claim 6 above, and Akins et al. (US 5,309,555 A).

Minoru states, in relation to the prior art that "there is a measurement machine which indicates what % measurement was completed" at paragraph 0005. However, Minoru does not explicitly state that this "%" indication is a part of the embodiment relied upon by the examiner in the claim 6 rejection above. Thus, Minoru does not teach the claim 7 requirement of "the message" being an image indicating a degree of progress of the scanning as a percentage.

Akins discloses a system in the same problem solving area of indicating the progress of an image processing task, comprising displaying a message indicating the degree of progress as a percentage ("a status message at the bottom of the Telesketch primary window displays 'percentage done' progress indicators so the users can see how far along the transmission has progressed" at column 12, line 40).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to add to the message image of Minoru at figure 1, letter E, a supplemental message indicating a degree of progress as a percentage as taught by

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Minoru in relation to the prior art, for the same reasons and motivation indicated by Akins. That is, one would be motivated to added the progress percentage indication so that the user of the Minoru system can see how far along the scanning has progressed (as described by Akins at column 12, line 40), thereby providing the user with an intuitive measure of the progress already made.

7. Claims 1-3, 8, 9 and 11-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Dimsdale et al. (US 2003/0001835 A1) and Corby, Jr. et al. (US 5,805,289 A).

Dimsdale

Regarding independent claim 1, Dimsdale discloses a 3D shape measuring system (figure 1; "three dimensions" at paragraph 0001) comprising:

a measuring section measuring a 3D shape of an object by scanning the object (figure 2, numeral 210);

a display section (figure 15, numeral 1510) displaying information about an area where the scanning has been completed by the measuring section ("display and visualization of scanned points" at paragraph 0216) in accordance with a progress of the scanning ("real time 3D data acquisition" at paragraph 0216; "each point returned is displayed in the data window 1620 as it is transmitted by the FDV 10" at paragraph 0228; "while the data is arriving" at paragraph 0228; thus, each point is displayed as it is

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returned from the scanner and therefore the points are displayed in accordance with the progress of the scanning); and

an imaging section for taking a two-dimensional image of the object (figure 2, numeral 220; "one window 1610 (Fig. 16A) displays a video image of the target scene ..." at paragraph 0218);

wherein the display section displays information about an area where the scanning has been completed as well as an area where the scanning has not completed yet (as described above, the intensity of the reflected laser pulses is displayed "while the data is arriving" and thus, areas that have arrived are displayed and areas that have not arrived are not displayed, in accordance with the progress of the processing).

Regarding claim 2, the measuring section includes:

a scanning section changing measurement direction (figure 6A); and

a distance measuring section measuring distance to the object in each measuring direction ("each data point ... represents both distance to a corresponding laser impingement point ... and the angle from the origin point" at paragraph 0098; "the position in three-dimensional space of each scanned point" at paragraph 0090; "the laser is pulsed, the distance to the object 20 is usually measured by the time of flight" at paragraph 0102; one distance measurement is made for each scanned position, representing one scanning direction); and

the measuring section measures the 3D shape of the object based on the measured distance ("CGP module generates a CGP model 42" at paragraph 0087).

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Regarding claim 3, distance is calculated by flight time of a pulsed laser ("time-of-flight" at paragraphs 0102 and 0103).

Differences

Regarding claim 1 (from which claims 2 and 3 depend), Dimsdale does not disclose displaying the two-dimensional image of the object and identifiably showing an area of the two-dimensional image where the scanning has been and has not been completed. That is, Dimsdale's 3D data and 2D images are displayed in separate windows, and thus Dimsdale does not show, on the 2D image, areas where scanning is completed.

Corby

Corby discloses a system for acquiring 3D data of an object, wherein Corby captures 3D data and a 2D image of the object (figure 1, numerals 12 and 11 respectively); comprising displaying the two-dimensional image of the object and identifiably showing an area of the two-dimensional image where the scanning has been completed ("the user should be able to view CMM point measurements pictorially, for example superimposing the points over images of the [part]" at column 3, line 9; "a monitor displays the digital images, measured 3D locations, photogrammetry locations in a superimposed manner to a user and a user interface allows the user to select objects to be measured" in at the abstract; "these points may be overlaid on he images obtained from digital camera 11" at column 7, line 6).

The Combination

It would have been obvious at the time the invention was made to one of ordinary skill in the art to overlay, or superimpose the acquired 3D data locations of Dimsdale (i.e., as depicted at Dimsdale figure 16B) onto the 2D video image of the object of Dimsdale (i.e., as depicted at Dimsdale figure 16A) as taught by Corby as described above.

Motivation

One would be motivated to modify Dimsdale in this manner in order to provide an intuitive and visual method of “keeping track of measured points as well as ‘visualizing’ the measurements” (Corby, column 2, line 19), as well as allowing “the user to select objects to be measured” (Corby, abstract).

Stated another way, Dimsdale currently uses the 2D image display for the user to “indicate the region to be scanned” at paragraph 0222, and Dimsdale indicates that “any number of methods” can be implemented to achieve this end. One such method is taught by Corby as described above, where the points that have already been scanned are superimposed on the 2D image. By modifying Dimsdale in the manner described above, the user would be able to view the entire object, along with the scanned point, to see if any additional points need scanning or re-scanning to ensure enough coverage for subsequent 3D modeling.

Claim 8 is rejected on exactly the same grounds as claim 1 above.

Dimsdale meets claims 9 and 11-15 as described in the previous Office Action, the details of which will not be repeated.

8. Claims 1, 8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Ritter et al. (US 6,363,169 B1) and Corby, Jr. et al. (US 5,805,289 A).

Ritter

Regarding independent claims 1 and 8, Ritter discloses a 3D shape measuring system (figures 1, 8 and 9) comprising:

a measuring section measuring a 3D shape of an object by scanning the object (figure 1, numeral 2; figure 8, numeral S2); and

a display section (figure 24, numeral S59) displaying information about an area where the scanning has NOT been completed by the measuring section ("displaying the next shooting point of view" at column 16, line 42).

Regarding claim 10, Ritter discloses:

scanning and imaging sections changing a measuring direction and taking a two-dimensional image of the object (figure 1, numeral 2 and figure 9A; a camera is moved to various positions around the object 12 where images are taken at each position);

a detection section detecting a silhouette of the two-dimensional image (figure 9B); and

the measuring section measuring the three-dimensional shape of the object based on the detected silhouette (figures 9C and 9D).

Differences

Regarding independent claims 1 and 8, while Ritter displays information where an image needs to be taken as described above, Ritter does not disclose displaying a two-dimensional image of the object and identifiably showing an area of the two-dimensional image where the scanning has been and has not been completed.

Corby

Corby discloses a system for acquiring 3D data of an object, wherein Corby captures 3D data and a 2D image of the object (figure 1, numerals 12 and 11 respectively), comprising displaying the two-dimensional image of the object and identifiably showing an area of the two-dimensional image where the scanning has been completed ("the user should be able to view CMM point measurements pictorially, for example superimposing the points over images of the [part]" at column 3, line 9; "a monitor displays the digital images, measured 3D locations, photogrammetry locations in a superimposed manner to a user and a user interface allows the user to select objects to be measured" in at the abstract; "these points may be overlaid on he images obtained from digital camera 11" at column 7, line 6).

The Combination

It would have been obvious at the time the invention was made to one of ordinary skill in the art to overlay, or superimpose the acquired 3D data locations of Ritter onto the 2D image of the object as taught by Corby as described above.

Motivation

One would be motivated to modify Ritter in this manner in order to provide an intuitive and visual method of "keeping track of measured points as well as 'visualizing' the measurements" (Corby, column 2, line 19), as well as allowing "the user to select objects to be measured" (Corby, abstract).

Stated another way, Ritter currently displays "the next shooting point of view" at column 16, line 42. As modified, the points that have already been taken are superimposed on a 2D image of the object, where the user would be able to view the entire object, along with the scanned points, to see if any additional points need scanning or re-scanning to ensure enough coverage for subsequent 3D modeling.

Response to Arguments

9. Applicant's arguments at sections I-IV of the response filed on May 27, 2004 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is advanced above.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

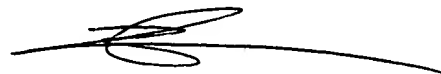
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian P. Werner whose telephone number is 703-306-3037. The examiner can normally be reached on M-F, 8:00 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo H. Boudreau can be reached on 703-305-4706. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Brian Werner
Patent Examiner
Art Unit 2621
August 11, 2004



BRIAN WERNER
PRIMARY EXAMINER